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FOREST RESEARCH NOTES

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Windthrow A Hazard In Virginia Pine Strip Cuttings

The eye of Hurricane Hazel passed to the west of the Beltsville Experimental Forest in Maryland on the afternoon of October 15, 1954. Sustained wind velocities of 66 mph (from the SE), with maximum gusts of 98 mph, were recorded nearby.

Some scattered trees throughout the Experimental Forest were broken off or blown down. The damage was studied on two compartments that had been logged by the strip-cutting method (table 1). The cut strips were three chains wide in Compartment A and two chains wide in Compartment B. The uncut strips were one chain wide, running generally NE and SW.

Literature on the silvics and management of Virginia pine is scanty. But as the use of this species increases, so does interest in its management. The observations reported here are a small but possibly significant contribution to what we know.

The merchantable volume lost on Compartment A was 7.7 percent of the pine on the uncut strips, and 2.2 percent of the hardwood. Figured on a per-acre basis, these losses on the uncut strips amounted to 153 cubic feet of pine and 14 cubic feet of hardwood. The loss ratio on Compartment B was similar.

More trees broke off than were blown over. This may have been due to the long drought before the storm, which resulted in a firm anchorage for the roots. Had the ground been wetter, a greater proportion of the trees might have blown down. Another factor that may have led to breakage was red rot it was noticed at the point of breakage in 14 out of 85 pines.

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Table 1.--Summary of wind damage done by Hurricane Hazel on uncut strips in recently cut Virginia pine-hardwoods

Compartment	Species	Size class (d.b.h.)	Losses per acre* due to--				Total losses	
			Breakage		Windthrow			
			Trees	Volume	Trees	Volume	Trees	Volume
		Inches	No.	Cu.ft.	No.	Cu.ft.	No.	Cu.ft.
A	Virginia pine	5-9	0.5	2.2	0.1	1.0	0.6	3.2
		9+	2.1	53.9	1.9	54.9	4.0	108.8
	Pitch pine	5-9	.5	3.0	0	0	.5	3.0
		9+	1.6	36.6	.1	1.7	1.7	38.3
	Hardwoods	5-9	0	0	0	0	0	0
		9+	.1	1.8	.7	12.0	.8	13.8
B	Virginia pine	5-9	1.3	7.1	.6	3.8	1.9	10.9
		9+	3.1	64.0	1.5	43.8	4.6	107.8
	Pitch pine	5-9	0	0	0	0	0	0
		9+	.4	8.7	0	0	.4	8.7
	Hardwoods	5-9	.3	.3	0	0	.3	.3
		9+	0	0	.4	9.9	.4	9.9
Average total loss		--	4.95	88.80	2.65	63.55	7.60	152.35

*Merchantable cubic-foot volumes to a 4-inch top.

Study of storm damage was limited to the two predominant species, Virginia pine and pitch pine. Of the two, Virginia pine was more susceptible to damage. The storm damage can be summed up this way:

	Pitch pine		Virginia pine	
	No. trees	Cubic feet	No. trees	Cubic feet
Before hurricane	532	9,667	363	6,204
Lost in hurricane	18	350	39	952

The greatest volume losses of pine were in the larger size classes: 3.5 percent in the 5- to 9-inch d.b.h. classes and 8.3 percent in the trees 9 inches and larger.

Though storms like Hurricane Hazel are spectacular and cause great damage, the cumulative effects of lesser storms cannot be overlooked. Such storms may occur every

year, usually associated with summer thunder showers; and they are often ushered in with gusty winds that for brief periods may rise to 50 or 60 mph.

A study of damage from these lesser storms was made on Compartment A. It showed (table 2) that cumulative losses from such storms over a 2-year period were nearly equal to the losses from the October 1954 hurricane. In these storms too, breakage losses exceeded windthrow losses.

Table 2.--Wind losses from Hurricane Hazel compared with losses from smaller storms over 2-year period

(In number of trees per acre)

Species	Hurricane Hazel		Prior 2-year period	
	Breakage	Windthrow	Breakage	Windthrow
Virginia pine	2.59	2.00	3.76	0.82
Pitch pine	2.00	.12	1.65	.12
Total	4.59	2.12	5.41	0.94

One possible cause of the wind losses on these two compartments may be the age of the stands. They average about 65 years old. The strip cutting method used here as part of a special study is normally used in younger stands, for harvesting pulpwood. Wind losses in another compartment that averaged 45 years old were less.

U. S. Weather Bureau records indicate a possible frequency of severe storms in this area about once in 5 years. So the possibility of wind damage should be considered in managing forests that contain large proportions of Virginia pine in the Coastal Plain area.

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